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         (FILE 'HOME' ENTERED AT 06:34:18 ON 25 NOV 2002)
         FILE 'CA' ENTERED AT 06:34:30 ON 25 NOV 2002
L1     2373516 S MIXTURE OR MIXED OR MIXING OR MIX
L2       99211 S DATABASE OR DATA BASE OR LIBRARY
L3      584065 S STANDARD OR CALIBRAT?
L4        4213 S L1 AND L2
L5       75121 S L1 AND L3
L6         391 S L4 AND L5
L7     2488078 S GRAPH? OR MODEL? OR DISPLAY? OR REPRESENT? OR DIAGRAM
L8      444110 S L7 AND (TEMP OR TEMPERATURE OR DEG)
L9       73451 S L1-3 AND L8
L10         33 S L6 AND L9
L11        141 S L6 AND (LIQUID OR FLUID OR SOLUTION OR AQUEOUS OR WATER OR H2O)
L12     139476 S TITRATE# OR TITRANT OR TITRATION OR TITRATING
L13     178081 S L1(3A)(PREPAR? OR FORM? OR MAKE)
L14      16857 S L1(5A)(PLURAL? OR MULTI? OR ARRAY OR LIBRARY)
L15       1306 S L13 AND L14
L16          9 S L12 AND L15
L17        552 S L15 AND (LIQUID OR FLUID OR SOLUTION OR AQUEOUS OR WATER OR H2O)
L18         48 S L17 AND (REPLAC? OR REMOV?)
L19         15 S L17 AND L3
L20         34 S L8 AND L17
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L23         20 S L22 AND L8
L24        112 S L22 AND (LIQUID OR FLUID OR SOLUTION OR AQUEOUS OR WATER OR H2O)
L25        381 S L10-11,L16,L18-20,L23-24
L26        252 S L25 NOT PY>1998
L27          4 S L25 AND PATENT/DT NOT L26 AND PY<1999
L28        256 S L26-27

=> d bib,ab 1-256 128
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L28 ANSWER 23 OF 256   CA   COPYRIGHT 2002 ACS
AN   129:193625   CA
TI   Considerations on the potentiometric log P determination
AU   Kramer, Stefanie D.; Gautier, Jean-Claude; Saudemon, Philippe
CS   Pharmaceutical Sciences Department. Sanofi Recherche, Montpellier, Fr.
SO   Pharmaceutical Research (1998), 15(8), 1310-1313
AB   A complementary approach to the existing calcn. program to calc. log P
     values from the **titrated** aq. pKa and the apparent pKa values (pKaapp) in
     biphasic systems. The presented data anal. method can be used for all
     kinds of protonable and deprotonable mols. like monoprotic and **multiprotic**
     acids and bases, **mixed** functional, and zwitterion **forming** compds. It
     permits an accurate evaluation of the results, which is not always evident
     when using the complex calcn. program delivered with the instruments.

L28 ANSWER 61 OF 256   CA   COPYRIGHT 2002 ACS
AN   126:270592   CA
TI   The structure of mesophases of binary and **multicomponent mixtures** of some
     cholesteric **liquid** crystals
AU   Obadovic, Dusanka Z.; Vajda, Aniko; Katona, Tibor Toth; Marinkovic -
     Neducin, Radmila
CS   Institute of Physics, Faculty of Sciences, Novi Sad, Yugoslavia
SO   Molecular Crystals and Liquid Crystals Science and Technology, Section A:
     Molecular Crystals and Liquid Crystals (1995), 265(Proceedings of the 15th

International Liquid Crystal Conference, 1994, Pt. 5), 2701-2707

AB Binary and **multicomponent mixts**. of cholesteryl enanthate with cholesteryl nonanoate and cholesteryl formate were studied. The aim of the study is the prepn. of the system with phase transition **temp**. close to room **temp**. Phase **diagrams** of binary **mixts**. are **formed** from data obtained by the optical microscopy and DS calorimetry and the shift of phase transition points of order 30-50° with respect to initial components was established. In the case of three- and four-component mixts., the presence of enantiomorphic phase transitions of smectic and cholesteric type, resp. was identified. X-ray diffraction data have enabled the characterization of the structure of smectic or cholesteric mesophase and the calcn. of mol. parameters: apparent length of the mols. l and the av. intermol. distance (D).

AN 126:214574   CA
TI Modeling of the solubility of a one-component H_2O or CO_2 **fluid** in silicate **liquids**
AU Papale, Paolo
CS Cent. Studio Geos logia Strutturale Dinamica Appennino, Pisa, I-56126, Italy
SO Contributions to Mineralogy and Petrology (1997), 126(3), 237-251
AB The modeling of the soly. of **water** and carbon dioxide in silicate **liqs**. (flash problem) is performed by assuming mech., thermal, and chem. equil. between the **liq**. magma and the gas phase. The **liq**. phase is treated as a **mixt**. of ten silicate components + H_2O or CO_2, and the gas phase as a pure H_2O or CO_2. A general model for the soly. of a volatile component in a **liq**. is adopted. This requires the definition of a **mixing** equation for the excess Gibbs free energy of the **liq**. phase and an appropriate ref. state for the dissolved volatile. To constrain the model parameters and identify th most appropriate form of the soly. equations for each dissolved volatile, a large no. of exptl. soly. detns. (640 for H_2O and 263 for CO_2) have been used. These detns. cover a large region of the P-T-compn. space of interest. The resultant **water** and carbon dioxide soly. models differ in that the **water** model is regular and isometric, and the carbon dioxide model is regular and non-isometric. This difference is consistent with the different speciation modalities of the two volatiles in the silicate **liqs**., producing a compn.-independent partial molar volume of dissolved **water** and a compn.-dependent partial molar volume of dissolved carbon dioxide. The H_2O soly. model may be applied to natural magmas of virtually any compn. in the P-T range 0.1 MPa-1 GPa and > 1000 K, whereas the CO_2 soly. model may be applied to several GPa pressures. The general consistency of the **water** soly. data and their relatively large no. as compared to the **calibrated** model parameters (11) contrast with the large inconsistencies of the carbon dioxide soly. detns. and their low no. with respect to the CO_2 model parameters (22). As a result, most of the soly. data in the **database** are reproduced within 10% of approxn. in the case of **water**, and 30% in the case of carbon dioxide. When compared with the exptl. data, the H_2O and CO_2 soly. models correctly predict many features of the satn. surface in the P-T-compn. space, including the change from retrograde to prograde H_2O soly. in albitic **liqs**. with increasing pressure, the so-called alkali effect, the increasing CO_2 soly. with increasing degree of silica undersatn., the Henrian behavior of CO_2 in most silicate **liqs**. up to about 30-50 MPa, and the proportionality between the fugacity in the gas phase, or the satn. activity in the **liq**. phase, and the square of the mole fraction of the dissolved volatile found in some unrelated silicate **liq**. compns.

AN   124:218999 CA
TI   A simple method for the **titration** of **multicomponent** acid-base **mixtures**
AU   Toisio, T.; Heikonen, M.
CS   Valio Ltd., Helsinki, FIN-00370, Finland
SO   Fresenius' Journal of Analytical Chemistry (1996), 354(3), 271-7

AB   A **titrn**. method was developed to analyze acid mixts., in which the pK
     values differed by 0.5 to 1 pH units. Instead of the use of equivalence
     points a buffer capacity curve is numerically derived from the **titrn**. curve
     resulting in a presentation similar to chromatograms and spectra. The
     consumption of the NaOH **titrant** is detd. within pH intervals of 0.2-0.6
     units around the pK values of the components. The buffer capacity measured
     is expressed as the consumption of NaOH over the pH interval. The amts. of
     compds. are found from these results using simple models of chemometrics.
     The method was applied to a **mixt**. of **formic** and acetic acids with concns.
     of 0-3 mmol/20 mL with an error of 0-0.05 mmol. Also a curve-fitting
     method based on a theor. equation of buffer capacity can be applied with an
     error slightly larger than with the previous method. In this case, the pK
     values were also computed. For **titrns**. beyond the pH range 4-10, the
     buffer capacity of H2O has to be subtracted from the **titrn**. results. The
     whole procedure requires including the computations ~3-6 min.

AN   124:157363 CA
TI   Thermodynamics of **aqueous** electrolytes at high **temperatures** by the
     isopiestic technique
AU   Holmes, H. F.; Mesmer, R. E.
CS   Chemical and Analytical Sciences Division, Oak Ridge National Laboratory,
     Oak Ridge, TN, 37831-6110, USA
SO   Physical Chemistry of Aqueous Systems: Meeting the Needs of Industry,
     Proceedings of the International Conference on the Properties of Water and
     Steam, 12th, Orlando, Fla., Sept. 11-16, 1994 (1995), Meeting Date 1994,
     533-40. Editor(s): White, Howard J., Jr. Publisher: Begell House, New
     York, N. Y.

AB   Excess thermodn. properties of a wide variety of **aq**. electrolyte **solns**. at
     elevated **temps**. were detd. with the ORNL high-**temp**. isopiestic facility.
     This unique exptl. app. provides very precise results over the useful **temp**.
     range of 110-250°. The isopiestic method is a comparative technique which,
     in the present case, uses the Pitzer-Peiper-Busey formulation for NaCl(**aq**)
     as the **ref**. electrolyte. At elevated **temps**. the ion-interaction **model** of
     Pitzer continues to be the most useful description of the exptl. results.
     The exptl. program included the alkali metal chlorides, sulfates,
     hydroxides, bromides, and bisulfates, the alk. earth metal chlorides, and
     several specific compds. of scientific and practical interest. Numerous
     common-ion **mixed** electrolyte **solns**. were also investigated in this program.
     In general, the activity coeffs. of all the studied electrolytes decrease
     with increasing **temp**. However, prominent differences between members of
     the same family remain, particularly when considered as the excess Gibbs
     free energy. The tendency for ion assocn. increases with increasing **temp**.
     and becomes a factor at the higher **temps**. Trends and specific effects are
     illustrated with examples taken from the **database** generated in our high-
     temp. thermodn. program.

AN   122:70730 CA
TI   Qualitative analysis in the near-infrared region
AU   Downey, Gerard
CS   Dep. Plant Marine Foods, Natl. Food Cent., Dublin, UK
SO   Analyst (Cambridge, United Kingdom) (1994), 119(11), 2367-75

AB   A review, with 29 refs., provides an up-to-date overview of the chemometric
     approaches available to users of near-IR spectroscopy specifically for the
     soln. of qual. anal. problems. The problems addressed include
     discrimination between similar materials of different functional classes;
     identification of pure chems. using a previously established·spectra
     library; selection of optimum **calibration** sample sets with detection of
     outlying and redundant samples; and preliminary studies into the anal. of
     mixts. Among procedures discussed are discriminant methods (both
     supervised and unsupervised) and pattern recognition techniques.

AN   115:84579 CA
TI   Experimental methods for determining the eutectic composition of a **multi-**
     component **liquid** crystal **mixture**
AU   Margerum, J. David; Van Ast, Camille I.; Myer, Gary D.; Smith, Willis H.,
     Jr.
CS   Hughes Res. Lab., Malibu, CA, 90265, USA
SO   Molecular Crystals and Liquid Crystals (1991), 198, 29-36
AB   Exptl. techniques are described for detg. the eutectic compn. of
     multicomponent mixts. of nematic **liq**. crystals. These techniques were
     applied to the formulation of nematic esters, when the idealized eutectic
     compn. calcd. by the Schroeder-Van Laar relationship did not give a good
     m.p. min. for the mixt. One exptl. procedure was based on the assumption
     that the compn. of the initial nematic melt from a frozen, crystd. mixt. is
     closer to a true eutectic than is the calcd. value from which the frozen
     mixt. was **formulated**. Another exptl. procedure was based on the assumption
     that a new eutectic could be obtained by **adding small amts**. of a new
     component to an existing **multi**-component eutectic **mixt**., using the plot of
     the m.p. vs. the percentage of the new component added to det. a new
     eutectic mixt. corresponding to a new m.p. min. High performance **liq**.
     chromatog. was used to est. the purity of each component, and to analyze
     quant. the component compn. of each melt. The **calibration** plots for each
     liq. crystal component, as well as the chromatog. anal. of the mixts. are
     shown.

AN   111:239373 CA
TI   Calorimetric determination of **mixing** energies in **multicompartment** systems.
     Part 1: Construction of a **titration** calorimeter and interpretation by
     means of the deconvolution of the measuring function
AU   Mueller, B. W.; Franzky, H. J.
CS   Christian-Albrechts Univ., Kiel, Fed. Rep. Ger.
SO   Pharmazie (1989), 44(7), 462-6
LA   German
AB   Microemulsions (esp. pharmaceutical) contg. surfactants, cosurfactants,
     oil, and **water** form oil-in-**water** and **water**-in-oil emulsions if they are
     dispersed systems and not colloidal **solns**. The study deals with the
     construction of a **titrn**. calorimeter and detn. of mixing enthalpies of a 2-
     component system by means of the deconvolution of the measuring function.
     A detailed scheme for the calorimeter construction, its **calibration** aspects
     and free mixing enthalpy of ethoxylated glycerol monostearate-**H2O** systems
     are discussed.

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L1   36849 S (ADD? OR INJECT?)(2A)(AMOUNTS OR PORTIONS OR VOLUMES)OR(MULTIPLE OR
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L5      55 S L4 AND(PROPERTY OR STEPWISE OR STEP WISE)
L6     112 S L4 NOT L5
L7       4 S L6 AND(CHCL3 OR STANDARD ADDITION OR REFRACTIVE INDEX)
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                OR INJECTION)
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L10    121 S L5,L7,L9
L11    106 S L10 NOT PY>1998

=> d bib,ab 1-106 l11
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L11   ANSWER 2 OF 106   CA   COPYRIGHT 2002 ACS
AN   128:123233   CA
TI   Asymmetric distribution of results in **calibration** curve and **standard addition** evaluations
AU   Renman, Lars; Jagner, Daniel
CS   Analytical and Marine Chemistry, Department of Chemistry, University of Goteborg, S-412 96 Goteborg, Swed.
SO   Analytica Chimica Acta (1997), 357(1-2), 157-166

AB   The inherent asymmetry in the application of linear regression anal. to the detn. of sample analyte concns. using **calibration** curve or **std. addn.** evaluations gives rise to systematic errors. On the av., this always results in an overestimation of the true analyte concns. in **std. addn.** evaluations, while in **calibration** curve evaluations, the mean relative error depends on the value of sample concn. in relation to the analyte concns. used for the **calibration** curve. In both evaluation techniques, the distribution of the results will deviate from a Gaussian distribution even if all anal. signals are normally distributed. It is shown that, for the **std. addn.** technique and for samples with low analyte concns. evaluated by the **calibration** curve technique, optimum precision and accuracy is obtained by using a min. no. of **calibration** points or **std. addns.**, and performing **multiple** measurements on these. It is also shown that the linear regression correlation coeff. is a very poor indicator of the accuracy and precision in multiple-point **std. addn.** evaluations. Weighted linear regression can be used to decrease the magnitudes of the systematic errors, but due to the inherent asymmetry, the distribution of the results will nevertheless be non-Gaussian. A publically available, inhouse constructed Windows 3.1/Windows 95 program, capable of simulating all kinds of **calibration** curve and **std. addn.** evaluations, was used for all calcns.

L11   ANSWER 6 OF 106   CA   COPYRIGHT 2002 ACS
AN   123:51462   CA
TI   Determination of zinc in plasma by atomic absorption spectrometry with a graphite furnace and pyrolytic platform
AU   Burrini, C.; Borghi, G.; Fuzzi, G.
CS   Ist. Ricerche Clin., Florence, Italy
SO   Giornale Italiano di Chimica Clinica (1994), 19(2), 127-31
AB   We present a precise and accurate method for the detn. of zinc in blood

plasma by at. absorption spectrometry with graphite furnace and pyrolytic platform. The samples were dild. 40-fold with a 0.1% nitric acid and 0.025% Triton X 100 soln., six microliters of this diln. were utilized for the measurement. Zinc concns. were calcd. by comparison with a **calibration** curve prepd. by **adding** known **amts**. of a std. soln. to a dild. sample (**std. addns**. technique). The detection limit was 0.03 mg/L. Within-run CVs were 1.30% and 2.00% for plasma zinc concns. of 0.76 and 1.57 mg/L, while between-run CV was 3.86% for a concn. of 0.86 mg/L.

L11 ANSWER 8 OF 106 CA COPYRIGHT 2002 ACS
AN 122:280756 CA
TI Validation of an analytical instrumental method by **standard addition** methodology
AU Rodriguez, Luis Cuadros; Campana, Ana M. Carcia; Barrero, Fermin Ales; Linares, Carlos Jimenez; Ceba, Manuel Roman
CS Fac. Sci., Univ. Granada, Granada, 18071, Spain
SO Journal of AOAC International (1995), 78(2), 471-6
AB A statistical procedure to validate an anal. methodol. by **std. addn**. methodol. is described. The data set obtained in 3 **calibration** expts. with **std**. dilns., **std. addns**., and **portions** of sample was used. The accuracy of the anal. results is checked by comparison of analyte contents in the different **calibrations** and from the recovery. Math. expressions to est. the statistical parameters are proposed. The statistical protocol was applied to fluorometric detn. of Mo with alizarin S in vegetable tissues.

L11 ANSWER 19 OF 106 CA COPYRIGHT 2002 ACS
AN 115:196939 CA
TI In situ measurement of **electrode** slope and gravimetric multiple **standard addition** analysis by ion selective potentiometry without prior **calibration** of **electrode**
AU Chaudhuri, N. K.; Sawant, R. M.
CS Fuel Chem. Div., Bhabha At. Res. Cent., Bombay, 400 085, India
SO Analytical Letters (1991), 24(9), 1605-24
AB Two methods of calcn. for the detn. of an unknown concn. by gravimetric multiple **std. addn**. anal. using ion selective potentiometry without prior **calibration** of the electrode are described. These are based on simple calcn. procedures involving linear least square fitting to Gran's equation to evaluate first the actual electrode slope 'in situ', then the unknown concn. and the cell const. One method is iterative and the other is noniterative. The applicability of the methods is demonstrated by processing the exptl. data obtained by using fluoride and uranyl ion selective electrodes.

L11 ANSWER 24 OF 106 CA COPYRIGHT 2002 ACS
AN 114:74518 CA
TI Linearized **multiple standard additions** for the potentiometric determination of weak acids
AU Macca, Carlo
CS Dep. Inorg., Organomet. Anal. Chem., Univ. Padova, Padua, I-35131, Italy
SO Talanta (1990), 37(12), 1141-9
AB The feasibility of potentiometric detn. of weak monoprotic acids by the multiple **std. addn**. method is examd. A std. **soln**. of pure weak acid is added to the **soln**. contg. an unknown amt. of the same weak acid, alone or **mixed** with its conjugate base. The exptl. data are processed by Gran-type plots, for which rigorous and approx. equations are obtained. It is shown that weak acids can be detd. by **multiple std. addns**. with a precision comparable with that of the usual kinds of potentiometric

addn. methods. The validity range of the approx. equations is
established. Linear equations similar to those of Hofstee, Scatchard,
Lineweaver and Burk, and Scott are also obtained, by which acidity consts.
can be detd. together with equivalence vols. The effects of systematic
and random measurement errors are examd.

AN   113:144237   CA
TI   Preparation of solutions before **titration** by the **standard addition**
       technique
AU   Zhukov, B. D.
CS   Pac. Inst. Oceanol., Vladivostok, USSR
SO   Zhurnal Analiticheskoi Khimii (1990), 45(6), 1167-72
AB   A method is described for prepg. solns. for **titrn.** by the **std. addn.**
       method involving the soln. to be **titrated** and the **titrant** and
       including the distribution of the sample between them. Tests showed the
       effectiveness of such a prepn. on an example of ionometry during the
       development of conditions providing for minimal consumption of the
       indifferent electrolyte salt, independent of the vol. and the no. of
       addns. of such anal. characteristics as the compn. of the supporting
       electrolyte, the ionic strength, the slope of the electrode function, etc.
       In an example of detg. the F- concn. in aq. solns. by using the **multiple
       std. addns.** method with ion-selective electrodes, the equalization of
       the compns. and the value of the physicochem. characteristics of the soln.
       being **titrated** and the **titrant** also allow one to eliminate the
       influence of effects related to diln. of the soln. being **titrated.**

AN   112:110981   CA
TI   Hybrid **multiple standard additions**-analyte **addition** method for
       ion-selective **electrodes** with integral **calibration**
AU   Velinov, G.; Panushev, A.
CS   Med. Acad., Sofia, 1000, Bulg.
SO   Analyst (Cambridge, United Kingdom) (1989), 114(8), 929-32
AB   A hybrid **multiple std. addns.**-analyte **addn.** method for
       ion-selective electrodes is described in which the **calibration** of the
       potentiometric cell and the detn. of the unknown concn. of the sample are
       carried out in a single expt. This ensures max. constancy of the
       calibration characteristics, E°' and S, of the cell. The
       proposed method allows the detn. of trace amts. (100 μg) of an analyte.
       The data treatment includes an iterative minimization procedure using the
       least-squares sum method, which improves the accuracy and the statistical
       reproducibility of the results. The method can be automated by means of
       an automatic **titrator**, controlled by an HP-85B microcomputer. A BASIC
       program was constructed for this purpose. The method was tested by
       applying it to the detn. of sodium, potassium, chloride and fluoride ions
       and the errors of the results were less than 1%. The detn. limit of the
       method was investigated by detg. decreasing concns. of fluoride ions. It
       was found that the method gives satisfactory results over the entire
       linear range of the ion-selective electrode.

AN   108:215482   CA
TI   Method of **parallel** addition in ionometry
AU   Urusov, Yu. I.; Tsygankov, A. M.; Zhukov, A. F.; Firer, A. A.
CS   Moscow Chemicotechnol. Inst., Moscow, USSR
SO   Zhurnal Analiticheskoi Khimii (1988), 43(3), 421-5
AB   A new method for detg. anions in acid media is based on **addn.** of equal

vols. of a std. soln. with different analyte concns. to 2 **parallel**
samples of equal vols. The effect of detn. conditions on the relative
error has been examd. by taking AuCl4- and PtCl62- as examples. The
method is useful for the detn. of anions in solns. of different acid
concn. by potentiometry with ion-selective electrodes.

L11   ANSWER 46 OF 106 CA COPYRIGHT 2002 ACS
AN   100:25847 CA
TI   Automatic **titration** by **stepwise addition** of equal **volumes** of
      titrant. Part VIII. Determination of alkalinity and total carbonate in
      seawater
AU   Johansson, Axel; Johansson, Sten; Gran, Gunnar
CS   Dep. Anal. Chem., R. Inst. Technol., Stockholm, S-100 44, Swed.
SO   Analyst (Cambridge, United Kingdom) (1983), 108(1290), 1086-90
AB   The reliability of a set of linear equations for the evaluation of
      titrn. data was investigated for the detn. of alky. and total CO32- in
      seawater by potentiometric **titrn**. with std. HCl **soln**. The method
      requires that polyprotic acids be treated as a **mixt**. of monoprotic acids
      and approx. values for equil. consts. for the acid-base pairs is known.
      The results agreed well with those obtained by nonlinear curve-fitting
      methods.

L11   ANSWER 54 OF 106 CA COPYRIGHT 2002 ACS
AN   94:202069 CA
TI   Automatic **titration** by **stepwise addition** of equal **volumes** of
      titrant. Part VI. Further extension of the Gran I method for
      calculation of the equivalence volume in acid-base **titrations**
AU   Gran, Gunnar; Johansson, Axel
CS   Dep. Anal. Chem., R. Inst. Technol., Stockholm, S-10044/70, Swed.
SO   Analyst (London) (1981), 106(1259), 231-42
AB   The equivalence vol., Ve, was calcd. from **titrn**. data by a method of
      stepwise addn. of equal vol. of **titrant** combined with an extended
      version of the Gran I method. The method can be used for monoprotic acids
      with log K ≤10. The Ve values for most di- and triprotic acids can
      also be calcd. by this method.

L11   ANSWER 56 OF 106 CA COPYRIGHT 2002 ACS
AN   93:211078 CA
TI   Automatic **titration** by **stepwise addition** of equal **volumes** of
      titrant. Part V. Extension of the Gran I method for calculation of the
      equivalence volume in acid-base **titrations**
AU   Johansson, Axel; Gran, Gunnar
CS   Dep. Anal. Chem., R. Inst. Technol., Stockholm, 10044/70, Swed.
SO   Analyst (London) (1980), 105(1253), 802-10
AB   The equiv. vol. is calcd. from **titrn**. data by a simple method based on
      stepwise addn. of equal **vols**. of **titrant** combined with an
      extension of the Gran I method. This method is also used to det. the
      conditional normal potential and the const. in the junction potential for
      an electrode couple in a given medium. **Titrns**. of very weak acids can
      not be evaluated by this method.

L11   ANSWER 58 OF 106 CA COPYRIGHT 2002 ACS
AN   92:33272 CA
TI   High accuracy titrimetric analysis
AU   Spivakovskii, V. B.; Dovgopol, O. S.; Makovskaya, G. V.; Moisa, L. P.
CS   Inst. Met. Phys., Kiev, USSR
SO   Zh. Anal. Khim. (1979), 34(9), 1681-6
AB   A method for the detection of the deviation of the **titrn**. end point from

the equivalence point and for taking into account coordination of all anal. operations from the viewpoint of accuracy ensures high accuracy in the titrimetric detns. of macroconcns. of elements or the main components of substances to be analyzed. The method was tested on the titrimetric detn. of Pb in Pb(NO3)2 of spectral purity with Complexon III at pH 4-8. The method involves **several std. addns.** of Pb, measurement of the a.c. polarog. peak current of Pb after each addn., and extrapolation of the curve obtained from these measurements.

L11 ANSWER 60 OF 106 CA COPYRIGHT 2002 ACS
AN 91:199756 CA
TI Automatic **titration** by **stepwise addition** of equal **volumes** of **titrant**. Part IV. General-purpose program for evaluating potentiometric acid-base **titrations**
AU Johansson, Axel; Johansson, Sten
CS Dep. Anal. Chem., R. Inst. Technol., Stockholm, S-100 44/70, Swed.
SO Analyst (London) (1979), 104(1240), 601-12
AB A computer program, TITRA, for evaluating acid-base **titrn.** results, using nonlinear regression techniques, was studied. All n-protic acids were treated as a **mixt.** of n monoprotic acids of the same molality as the n-protic acid. The parameter calcns. were performed in an appropriate sequence. No preliminary ests. of the required concns. were necessary. The method was applied to samples of mono- and polyprotic acids, **mixts.** of acids, ampholytes, salts of weak acids, acids with an abnormal sequence of stability const. values, and bases. E.g., for a **mixt.** of HCl, phthalic acid, and barbital, the amts. found were 1.000, 0.9992 and 1.0055 mmol, resp., compared with 1.000, 1.0025 and 1.0011 mmol added, giving a recovery of 100.0, 99.7 and 100.4%, resp.

L11 ANSWER 61 OF 106 CA COPYRIGHT 2002 ACS
AN 90:214572 CA
TI Microcomputer-aided high-speed potentiometric **titration** system by linear **titration** plots
AU Yamaguchi, Shinichiro; Kusuyama, Takashi
CS Wakayama Res. Lab., Kao Soap Co., Ltd., Wakayama, Japan
SO Fresenius' Z. Anal. Chem. (1979), 295(4), 256-9
AB An app. for high-speed potentiometric **titrn.** was assembled and its advantage was demonstrated. **Titrant addns.** were made **stepwise** in large vols. The optimum increment vols. were automatically chosen by microcomputer, depending upon the sample concn. Time intervals between the successive addns. were controlled so as to add a new increment immediately after the electrode was equilibrated. On-line calcn. of the equivalence vol. was conducted based upon linear **titrn.** plots by using only 4 **titrn.** points before the equivalence point. The app. was capable of detg. the concn. of strong and weak monoprotic acids in <22 s with relative std. deviations of 0.1-0.2%.

L11 ANSWER 62 OF 106 CA COPYRIGHT 2002 ACS
AN 89:172898 CA
TI Automatic **titration** by **stepwise addition** of equal **volumes** of **titrant**. Part III. Use of linear equations to calculate equivalence volumes in acid-base **titrations**
AU Johansson, Axel; Johansson, Sten
CS Dep. Anal. Chem., R. Inst. Technol., Stockholm, Swed.
SO Analyst (London) (1978), 103(1225), 305-16
AB A computational procedure is described for calcg. equivalence vols. for the **titrn.** of monoprotic acids, bases, and ampholytes with log K (K = stability const.) ≤11. The procedure is based on the **soln.** of a

set of linear equations and requires only a few sets of measurements of emf. vs. **titrant** vol. plus the initial vol. and **titrant** concn. Log K values are not required and emf. measurements may have a const. systematic error of ± 6 meV, corresponding to ± 0.1 pH unit. The program can automatically select appropriate measurements. Exptl. results had std. deviations <0.2%.

L11 ANSWER 66 OF 106   CA   COPYRIGHT 2002 ACS
AN   87:77978   CA
TI   Acid-base **titrations** by **stepwise addition** of equal **volumes** of
     titrant with special reference to automatic **titrations**.   IV.
     Photometric **titration** of an acid
AU   Pehrsson, Lennart; Ingman, Folke
CS   Dep. Anal. Chem., R. Inst. Technol., Stockholm, Swed.
SO   Talanta (1977), 24(2), 87-90
AB   The method of **stepwise addn.** of **titrant** in acid-base **titrns.**
     (1977) is applied to photometric **titrn.** of monoprotic acids. The
     highest precision is obtained when the absorbance of the **titrn. mixt.**
     changes linearly with each addn. of **titrant.** For weak acids good
     results are found if the stability consts. of the acid and indicator
     differ by 0.3-0.5 logarithmic units. The method is tested on the **titrn.**
     of 0.01006M HCO2H with 0.1M NaOH and bromophenol blue indicator. Ten
     consecutive **titrns.** gave the concn. as 0.01007M with a coeff. of
     variation 0.12%. The advantages and disadvantages of the method are
     discussed.

L11 ANSWER 67 OF 106   CA   COPYRIGHT 2002 ACS
AN   87:77942   CA
TI   Acid-base **titrations** by **stepwise addition** of equal **volumes** of
     titrant with special reference to automatic **titrations**.   III.
     Presentation of a full automatic **titration** apparatus and of results
     supporting the theories given in the preceding parts
AU   Pehrsson, Lennart; Ingman, Folke
CS   R. Inst. Technol., Stockholm, Swed.
SO   Talanta (1977), 24(2), 79-85
AB   The title app. holds 200 sample tubes and performs the following
     operations; pipetting of sample and addn. of neutral salt to give const.,
     high ionic strength; thermostatic temp. control to 25 $\pm$ 0.1°;
     addn. of **titrant** in equal vols. and detn. of the electrode potential
     after each addn.; rinsing of **titrn.** vessel and electrode couple; sample
     changeover. **Titrn.** results for monoprotic acids, e.g. HCO2H,
     HCO2H-EtCO2H **mixts.**, tartaric acid, K H phthalate, and HCO2H-HCO2-
     mixts. are given. These **titrns.** cannot be evaluated by the methods of
     G. Gran (1952) and B. H. J. Hofstee (1960) but the proposed method (1976)
     gives results accurate to 0.1%. The method is better than common **titrn.**
     methods in that all the data are used in the evaluation, permitting a
     statistical treatment.

L11 ANSWER 68 OF 106   CA   COPYRIGHT 2002 ACS
AN   86:182361   CA
TI   Acid-base **titrations** by **stepwise addition** of equal **volumes** of
     titrant with special reference to automatic **titrations**.   II.   Theory
     of **titration** of **mixtures** of acids, polyprotic acids, acids in
     mixture with weak bases, and ampholytes
AU   Pehrsson, Lennart; Ingman, Folke; Johansson, Sten
CS   R. Inst. Technol., Stockholm, Swed.
SO   Talanta (1976), 23(11-12), 781-8
AB   A general method is given for evaluating **titrn.** data for **mixts.** of

acids, and for acids **mixed** with weak bases, which allows use of relative
H concn. data, thus requiring only an approx. **calibration** of the
elctrode system. For simple systems, only a rough calcn. of stability
const. is required. Detailed example calcns. are given for **titrating** a
binary acid **mixt.**, a diprotic acid, an acid-conjugate base system, and
an ampholyte.

L11 ANSWER 69 OF 106 CA COPYRIGHT 2002 ACS
AN   86:8518 CA
TI   Determination of lead in saline water under use of flameless
     atomic-adsorption spectrophotometry
AU   Kussmaul, H.; Majlis, S. K.
CS   Frankfurt/Main, Ger.
SO   Gas- Wasserfach, Wasser - Abwasser (1975), 116(12), 552-4
LA   German
AB   While estg. Pb in the water samples by means of the flameless atomic
     absorption spectrophotometry (graphite-pipe curvette), disturbances
     depending on the matrix compn. were obsd. It was evident that these were
     caused mainly by the Na in the surface waters. Other ions could cause
     signal depression or intensification. For elimination of these
     disturbances, an addnl. procedure was suggested, in which the
     calibration curve was plotted in a soln. with the same matrix compn. as
     that of the measuring soln. It occurred in this case by gradual **addn.**
     of the **std.** soln. to the water sample. A water sample 100 ml is
     acidified with concd. H2SO4 1 ml, known Pb **amts.** are **added** stepwise,
     and the respective extinction coeffs. are measured. *By this the necessity*
     of a correction of the extinction depression was omitted, as the addn.
     procedure was equiv. to the plotting of the **calibration** *curve of a soln.*
     which contained the same matrix as the test sample.

L11 ANSWER 70 OF 106 CA COPYRIGHT 2002 ACS
AN   85:186166 CA
TI   Automated computer-controlled solution **handling** system utilizing weights
     of solution
AU   Renoe, B. W.; O'Keefe, K. R.; Malmstadt, H. V.
CS   Sch. Chem. Sci., Univ. illinois, Urbana, Ill., USA
SO   Anal. Chem. (1976), 48(4), 661-6
AB   An automated sample and reagent soln. prepn. system, which is generally
     applicable in the anal. lab., was designed and tested. The new system
     utilizes an electronic sensor to weigh accurately the nominal aliquots of
     sample and reagent solns. that are added to a disposable beaker. Each
     plastic beaker on a turntable is automatically positioned on the wt.
     sensor. Reagent and sample solns. are added by gravity feed for selected
     time intervals to provide nominal amts. Each reagent or sample is
     accurately weighed after addn., and the beaker is then automaticaly moved
     to a stirring station while another beaker is moved into position for wt.
     measurements. The **amts.** of reagents **added** to the beaker can be
     incrementally adjusted as desired. The operational modes are specified by
     interaction through FORTRAN programming and FORTRAN callable subroutines,
     which control or accumulate data concerning the system turntable, wt.
     sensor, soln. delivery devices and mixer, and the computer peripherals.
     The anal. utility of the system is demonstrated by data obtained in
     automated prepn. of working curves and **std.-addn.** procedures.

L11 ANSWER 73 OF 106 CA COPYRIGHT 2002 ACS
AN   79:73155 CA
TI   Automated system for photometric **titration** by **stepwise addition** of
     equal **volumes** of **titrant**

AU   Pehrsson, Lennart; Johansson, Axel
CS   Dep. Anal. Chem., R. Inst. Technol., Stockholm, Swed.
AB   A completely automatic system for photometric **titrns**. delivers measured
      vols. of sample, indicator **soln**., and buffer **soln**., **titrates**, and
      finally rinses the **titrn**. vessels. **Titrns**. are performed by adding
      the titrant stepwise in equal vols. to the sample, measuring the
      absorbance after each addn., and calcg. the equivalence vols. The system
      performs ~30 **titrns**./hr and has a loading capacity of 200 samples.
      It was tested by **titrating** Ca with EGTA in presence of calmagite as
      indicator.

L11   ANSWER 81 OF 106   CA   COPYRIGHT 2002 ACS
AN   73:126566   CA
TI   Automatic **titration** by **stepwise addition** of equal **volumes** of
      titrant.   II.   Automatic **titration** system
AU   Johansson, Axel; Pehrsson, Lennart.
CS   Dep. Anal. Chem., Roy. Inst. Technol., Stockholm, Swed.
AB   An automatic potentiometric **titrn**. app. pipets, dils., and **titrates**
      (by **addn**. of equal **vols**. of **titrant**) the sample and washes the
      electrodes and **titrn**. vessels, at a rate of ≤30 samples/hr.   HCl
      (0.03354M) and 0.02293M HOAc in a binary **mixt**. were detd. by using the
      app. with + 0.00016M and -0.00017M abs. errors, resp., and with 0.2 and
      0.9% relative std. deviations, resp.

L11   ANSWER 82 OF 106   CA   COPYRIGHT 2002 ACS
AN   73:83501   CA
TI   Computer approach to ion-selective **electrode** potentiometry by **standard
      addition** methods
AU   Brand, Michael J. D.; Rechnitz, Garry A.
CS   Dep. of Chem., State Univ. of New York, Buffalo, N. Y., USA
AB   Methods are described for detg. an unknown concn. by using an
      ion-selective electrode without prior **calibration** of the electrode.   The
      methods are based on **std. addn**. procedures.   In the simplest case,
      only 2 **std. addns**. are required and a simple calcn. is described which
      can be performed by a computing calculator.   To obtain high accuracy in
      the detn. of unknown concns., **multiple addns**. are made and a least
      squares curve fitting method is used to evaluate the unknown concn.,
      electrode slope, and std. potential.   A computer program to accomplish
      this calcn., ADDFIT, is given in Fortran IV.   The effectiveness of these
      methods is demonstrated by expts. on Pb and chloride samples.

L11   ANSWER 83 OF 106   CA   COPYRIGHT 2002 ACS
AN   73:51898   CA
TI   Automatic **titration** by **stepwise addition** of equal **volumes** of
      titrant.   I.   Basic principles
AU   Johansson, Axel
CS   Roy. Inst. Technol., Stockholm, Swed.
AB   The basic principles of a potentiometric **titrn**. method, which is based
      on making potential measurements after each addn. of **titrant** in
      equal-vol. increments, are described. The method is esp. suitable for
      automation, e.g. in biochem. and process control anal. The method is
      demonstrated by NaOH **titrns**. of HCl and HOAc, both alone and in **mixts**.

L11   ANSWER 91 OF 106   CA   COPYRIGHT 2002 ACS

AB   cf. CA 62, 12648f. End points for direct phase **titrns**. of binary solns.
        of nitropropanes in H2O-miscible solvents are fair and, because of the
        steepness of the **calibration** curve, results are adequate. EtNO2 ethane,
        in binary combination, gives poor end points but, over part of the optimum
        titrn. range, results are good. MeNO2 gives end points which are almost
        useless. **Addn**. of **standard amts**. of PhNO2, which gives excellent
        phase-**titrn**. end points, improves the composite MeNO2-PhNO2-H2O-miscible
        component end point markedly. Because the PhNO2 concn. is const., the H2O
        titer is a function only of the MeNO2 concn. **Addn**. of const. **amts**. of
        PhNO2 also increases the optimum **titrn**. range. Results given for all
        systems arc comparable in accuracy with systems previously reported which
        are favorable to direct phase **titrn**.

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